IPC-1751A

Generic Requirements for Declaration Process Management

IPC 175X Schema Version 2.0

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A standard developed by IPC





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- Contain simple (simplified) language
- Just include spec information
- Focus on end product performance
- Include a feedback system on use and problems for future improvement

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IPC-1751A

Generic Requirements for Declaration Process Management

Developed by the Supplier Declaration Subcommittee (2-18) of the Data Generation and Transfer Committee (2-10) of IPC

Users of this publication are encouraged to participate in the development of future revisions.

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FOREWORD

This standard provides the principles and details for declarations necessary between members of a supply chain relationship. This standard is the first in a series of standards that permits segmentation of declaration details based on the subject and scope of the declaration as well as the manufacturing domain. This standard contains general information and is supplemented by Sectional standards requiring more detailed information such as material declarations, quality profiles, or codes of conduct.

As an example, Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment requires information on a list of banned substances. These substances can be reported within one of the Sectional standards of the **175x** series. In particular, the Sectional standard (IPC-1752) establishes information exchange requirements regarding the substances and materials that comprise the bulk material, component, Printed Circuit Board (PCB), sub-assembly, etc.

Since the 175x standards are designed to be implemented in software tools, the standard is comprised of two types of specifications: (1) defining the minimal functional requirements for compliant software, and (2) defining the data format and structure for exchange. The data format is based on an Extensible Markup Language (XML) schema, which in turn is represented by a Unified Modeling Language (UML) model. All **175x** compliant software **shall** conform to the appropriate UML model. Any 175x data exchange **shall** conform to the XML schema requirements as herein specified in order to comply with this standard. Such XML data can be extracted by the requester to automate the data transfer into his internal systems, thereby insuring accurate, efficient, and reliable communication.

This standard is designed to serve the public interest by facilitating the transfer of information along the supply chain through a common data model and XML schema. Existence of such standards and publications shall not in any respect preclude any member or nonmember of IPC from manufacturing or selling products not conforming to such standards and publications, nor shall the existence of such standards and publications preclude their voluntary use by those other than IPC members, whether the standard is to be used domestically or internationally.

In addition to the TAEC 'Position Statement on Specification Revision Change' (located on the inside front cover of this document) which states that the use of the new revision is recommended but not automatically required for an existing relationship; in the case of materials declarations, use of the new version of the standard is recommended by the committee because it supports current regulations.

In this revision of the 175x series, only the data format and functional requirements are specified. Development of human readable data entry and viewing tools are intentionally left in the domain of third party software providers.

Acknowledgment

Any document involving a complex technology draws material from a vast number of sources. While the principal members of the Supplier Declaration Subcommittee (2-18) of the Data Generation and Transfer Committee (2-10) are shown below, it is not possible to include all of those who assisted in the evolution of this standard. To each of them, the members of the IPC extend their gratitude.

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Table of Contents

Generic Requirements for Declaration Process Management

1 SCOPE

This standard provides the principles and details necessary for declarations between members of a supply chain. Although this 1751 standard contains only generic information regarding trading partners, when combined with another specific 175x Sectional standard, the resulting document set is used to define and maintain the declaration information. The requirements pertain to both hard copy and electronic data descriptions. This standard provides for the creation of a record between trading partners, and therefore the data communicated may be used to help support and demonstrate due diligence in any subsequent representation based upon its contents.

1.1 Purpose

The purpose of the standard is to establish a methodology for a product or business attribute declaration process between suppliers and their customers which will define the form, structure, and content of the declaration to such an extent that it may be conveyed electronically without the necessity of human intervention. The standard benefits its adherents by providing consistency, efficiency, and integrity to the declaration process.

The purpose of this document is also to describe in text what the electronic data content consists of, so that its capabilities can be assessed, judged, and adopted by those in need of such a standardized approach to information exchange.

Because organizations may choose to verify information provided under this standard, brief procedures are described within this standard for such verification (see section 8).

1.2 Intent

The intent of the 175x standard set is to establish a standard data exchange format that will facilitate, improve, and secure data transfer between all members of a supply chain.

The intent of the 1751 standard is to define the generic information comprising the basis for such data exchange: who is requesting or making the declaration, basic identification and contact information for the party or parties involved, if there is a requester, then who is the recipient of the request, when is this happening, and similar basic information. The 1751 standard then intends to provide definition of the electronic data exchange format sufficient to convey mandatory and optional data contents.

IPC-1751 is “generic” because it specifies only basic identification and communication information which form the basis for further specific declarations. IPC-1751 is therefore intended to be used in conjunction with other 175x standards as needed which may be employed similar to menu items, building on the 1751 foundation.

Part of the intent is also to provide mechanisms for securing the integrity of the information exchanged.

1.3 Documentation Hierarchy

This 1751 standard establishes the generic requirements for a declaration process used to provide information with respect to a specified product or products on subjects of concern arising in the course of conducting business.

Declaration specifics are defined by each standard in the IPC-175x series of standards. Each standard has a specific focus and **shall** be used, as appropriate, to describe a particular declaration process. The Sectional standards and their focus are:

Version 2.0:

IPC-1751 *Generic Requirements for Declaration Process Management*

IPC-1752 *Materials Declaration Management*

IPC-1756 *Manufacturing Process Data Management*

Future Sectionals:

IPC-1753 *Laminate Structure Declaration Management*

IPC-1754 *Printed Board Declaration Management*

IPC-1755 *Electronic Assembly Declaration Management*

IPC-1756 *Manufacturing Process Data Management*

IPC-1758 *Declaration of Shipping, Packing and Packaging Materials*

1.4 Interpretation

The word "**shall**," the emphatic form of the verb, is used throughout this standard whenever a requirement is intended to express a provision that is ***mandatory***. Deviation from a "**shall**" requirement may be considered if sufficient data is supplied to justify the exception. The words "should" and "may" are used to express non-mandatory provisions intended to be recommendations. "Will" is used to express a declaration of purpose related to the text description. To assist the reader, the word "**shall**" is presented in bold characters.

1.5 Presentation

All dimensions in the 175x standard series are expressed in metric units with millimeters the main form of dimensional expression. Inches may be shown in brackets as appropriate and are not always a direct conversion depending on round-off discrepancies or the required precision. Users are cautioned to employ a single dimensioning system and not intermix millimeters and inches. The measurement of volume and mass (weight) **shall** also be in SI units. Reference information is shown in parentheses ( ).

2 APPLICABLE DOCUMENTS

The following documents form a part of this standard to the extent specified herein. The revision of the document in effect at the time a declaration is produced **shall** take precedence.

2.1 IPC Standards

IPC-T-50 Terms and Definitions

W3C XML: http://www.w3.org/XML/

W3C XML Schema: http://www.w3.org/XML/Schema

3 REQUIREMENTS

The following requirements are applicable to all the IPC-175x series of declaration management standards. In the event that a particular requirement does not apply, the alternate methodology is defined in the Sectional standard.

3.1 Terms and Definitions

The definition of all terms **shall** be in accordance with IPC-T-50 and the following. An asterisk (*) by the term indicates that it is a reproduction from IPC-T-50 and is provided to assist the reader in interpretation of this standard.

3.1.1 compliance

Demonstration of meeting a government regulation, law, or directive.

3.1.2 due diligence

Actions exercised and reasonable steps taken to avoid misrepresentation or committing of an offense.

3.1.3 producer

Any company or organization that, irrespective of the selling technique, manufactures and sells electrical and electronic equipment under their own brand, or resells under their own brand equipment produced by other suppliers, or imports/exports electrical and electronic equipment on a professional basis.

3.1.4 product

Any item such as substance, material, sub-part, part, sub-assembly or assembly that is the subject of a declaration.

3.1.5 product object

One or more products grouped together for the purpose of associating selected IPC-175x Sectional information to the grouping such that the provided information applies equally to each member of the grouping, thus alleviating the necessity for the supplier to provide the same information multiple times. See 5.2.

3.1.6 requester

The party initiating the 175x communication when using the request/response communication mode. The requester is the recipient of the supplier’s response.

3.1.7 subproduct

An entry applied to a product object for the purpose of defining a portion of that product per the supplier’s bill of materials, engineering documentation, or other logical structure. Subproducts may have their own subproducts; the number of subproduct levels is limited by logic and not the IPC-175x schema. The supplier provides all subproduct information. Requesters do not enter subproducts. See 5.2.2.

3.1.8 supplier

The organization or company responsible for providing the goods and/or services required to produce an electrical or electronic product.

3.1.9 user

The individual, organization, company or agency responsible for the procurement of electrical/electronic hardware, having the authority to define the class of equipment and any variation or restriction (i.e., the originator/custodian of the contract detailing these requirements).

4 FAMILY OF STANDARDS

This standard establishes the generic requirements for the declaration process herein defined. The standard becomes a ***mandatory*** part of any of the Sectional standards that are identified as part of the 175x series. The details are substantiated through the use of UML information. The specific requirements for the 1751 portion of this declaration system include naming the requester if there is one, naming the supplier to whom the request is addressed, or who is providing the declaration if not specifically requested, naming the product or products to which the declaration applies, and providing relevant ancillary information to facilitate and validate the information exchange.

4.1 Generic Declaration (IPC-1751)

This document covers requester and/or supplier company information, the products covered, a selection for detailed Sectional data (presently 1752 and 1756), with an optional electronic signature and a statement addressing legal validity. Either the supplier or the requester may initiate the form. See Section 5 for details.

An inquiry coming from a requester to a supplier should include the requester company and contact information, their product number(s) and supplier's manufacturing number(s), the type of information (per IPC-175x Sectionals and Subsectionals) and legal commitment requested. It **shall** also include identification of the product or products for which the information is requested.

In response, the supplier may then provide their company and contact information and the data being requested for the products the requester identifies.

If a supplier is simply offering a declaration without a specific request, the supplier will enter their company and contact information and indicate their preferred legal commitment. The supplier will also then provide the detail of data pertaining to the named product or products per the provisions of IPC-175x Sectionals and Subsectionals that the supplier selects.

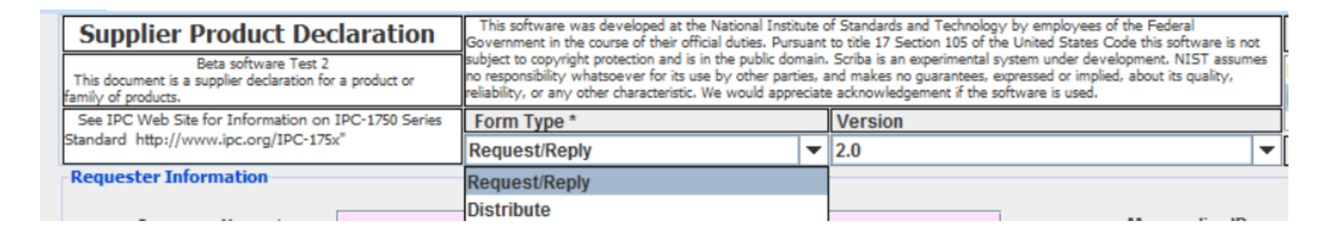


Figure 4-1 Example of how the form type and Sectional choice might appear in an implementation
(Refer to Appendix A for field descriptors)

The form type, whether Request/Reply (if one company is requesting a declaration from a supplier) or Distribute (if a supplier is proactively offering a declaration), **shall** be chosen as shown in the example Figure 4-1.

4.2 Materials Declaration Management (IPC-1752)

The details regarding the exchange of materials declaration data are defined in IPC-1752. A UML data model with the corresponding XML schema is provided to facilitate the information exchange between the producer and the customer.

IPC-1752 materials information is associated with the generic 1751 Sectional information by selecting "MaterialInfo." When the 1752 Sectional standard is so chosen, an additional selection of one or more

1752 Subsectionals is thereby necessitated. See IPC-1752 for a description of the four Subsectional alternatives. Also see Clause 5.2 for associating 1752 information with a product object.

4.3 Laminate Structure Declaration Management (IPC-1753)

This standard is under consideration and is intended to become a replacement for IPC-1730. The new standard will use the generic standard, IPC-1751, to provide company information.

4.4 Printed Board Declaration Management (IPC-1754)

This standard is under consideration is intended to become a replacement for IPC-1710 in the near future. The new standard will use the generic standard, IPC-1751, to provide company information.

4.5 Electronic Assembly Declaration Management (IPC-1755)

This standard is under consideration and is intended to become a replacement for IPC-1720 in the near future. The new standard will use the generic standard, IPC-1751, to provide company information.

4.6 Manufacturing Declaration Management (IPC-1756)

The IPC-1756 standard contains manufacturing information. In version one of 175x this information was included in 1752, but it has been moved to the IPC-1756 Sectional and expanded. This new standard will use the generic standard, IPC-1751, to provide business information and the product definition to which the declaration applies. See paragraph 5.2 for associating 1756 information with a product object.

5 DATA REQUIREMENTS FOR GENERIC DECLARATION

The data requirements for the declaration process management concepts, consists of two modes of data exchange. The first mode is that of “Request/Reply” where a user wishes to obtain information about a product. The second mode is that of “Distribute” where a supplier wishes to make product information available to potential customers.

5.1 Requester Information

This information describes the company and person who are requesting a declaration. This information is only relevant when a request/response model is being followed using one of the Sectional standards. This section of the data model contains several fields that identify the company and the individual requesting a particular declaration. Each field is described in the following paragraphs and is shown in the example in Figure 5-1.

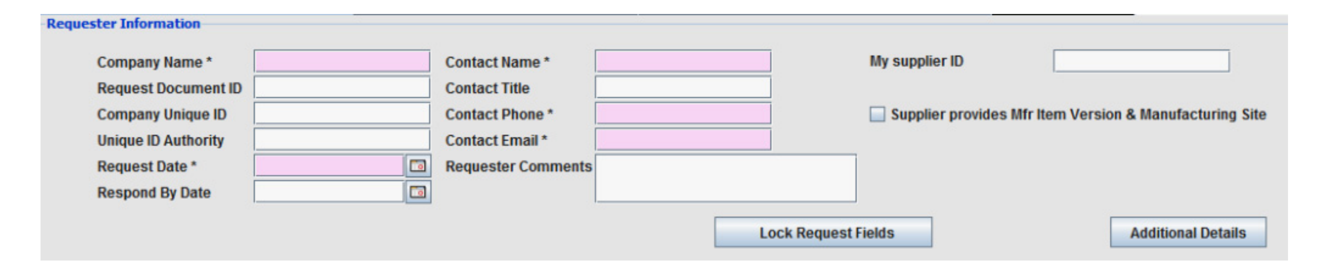


Figure 5-1 Example of how a requester information section might appear in an implementation

5.1.1 Company Information

5.1.1.1 Company Name

This field identifies the legal name of the company requesting the declaration document. This field is ***mandatory***.

5.1.1.2 Company Unique ID

These fields are used by industry to uniquely identify the requester company. For example, in the U.S. a Dun & Bradstreet Data Universal Numbering System (DUNS) number is a commonly used unique identification (ID). This field is *optional.*

5.1.1.2.1 Unique Identity

This field identifies the name or known designation of the requester company. This field is *optional*.

5.1.1.2.2 Unique ID Authority

This field identifies the organization that assigns the unique ID. In the example above, Dun & Bradstreet would be the authority assigning the unique ID. This field is *optional*.

5.1.2 Request information

5.1.2.1 Request Date

This field identifies the date when a user requests a declaration document. All date fields use the XML date format. This field is ***mandatory***.

5.1.2.2 Request Document ID

This field identifies the request to help the user and supplier reference the communication. A revision method should be established to identify different configurations of the same request. The methodology may be simply a single letter or date that establishes the appropriate linkage. This field is *optional*.

5.1.2.3 Comment

This field provides additional information to the supplier regarding the request. This field is optional. (see 5.1.4.1.)

5.1.2.4 Respond By Date

This field identifies the date when the supplier is expected to respond to the request for information. This field is *optional*.

5.1.2.5 Internal Supplier ID

This field identifies a company’s internal designator for a supplier. It might be a name or a supplier identification code. This field is *optional*. (See also 5.1.4.2).

5.1.2.6 Field Lock

The field lock attribute permits the requester to lock in the company name, request date, contact information etc. This field is *optional*.

5.1.2.7 Supplier Check Box

The supplier check box allows the supplier to provide the manufacturing item version and manufacturing site information for the request. If the check box is initiated the request becomes ***mandatory***. The requester should not lock the fields if this data entry is required by the supplier.

5.1.3 Contact Information

5.1.3.1 Contact Name

This field identifies the name of the person to contact with questions about the request for declaration. This field is ***mandatory***.

5.1.3.2 Contact Title

This field identifies the title of the contact person. This field is *optional*.

5.1.3.3 Comment

This field provides additional information to the supplier regarding the requester contact information. This field is *optional*. (See also 5.1.4.1.)

5.1.3.4 Contact Phone

This field identifies the telephone number for the contact person. This field is ***mandatory*** and consists of two attributes: the first is the phone number and the second is the phone type, e.g., business, personal, mobile etc. There may be multiple phone listings for the requester contact.

5.1.3.5 Contact Email

This field identifies the email address for the contact person. This field is ***mandatory*** and consists of two attributes: the first is the email number and the second is the email type e.g., general office, personal, department etc. There may be multiple email listings for the requester contact. (See also 5.1.4.1)

5.1.3.6 Additional Contact Info – Address

The requester may provide a physical address as part of the requester contact information. These fields are *optional*.

5.1.3.6.1 Internal

Any internal routing information necessary.

5.1.3.6.2 Street

The street number and name.

5.1.3.6.3 City

The name of the city.

5.1.3.6.4 State

The state or province.

5.1.3.6.5 Country

The country.

5.1.3.6.6 Zip Code

The postal code.

5.1.3.6.7 Comment

Additional comments related to the contact or contact information.

5.1.4 Other Descriptions

5.1.4.1 Requester Comments or URL for Additional Information

This field provides additional information to the supplier, such as definitions of the authorized representative field in the supplier information section, submission instructions, additional contact information, or information relating to fields in the Sectional standards. These can be provided either directly or by a URL address which shows where the additional information can be obtained. If a URL is provided it should be of the form http://xxx.xxxx.xxx. This field is *optional*.

5.1.4.2 My Supplier <Manufacturer> ID

This field states a company's internal designator for a supplier, such as a supplier identification code. For data tracking purposes, requesters can provide this designator under the My Supplier <Manufacturer> ID field. This field is *optional*.

5.1.4.3 Destination – URL or Email Address

This field identifies the URL or email address to which the requester wishes the data be submitted. This field is *optional*.

5.1.4.4 E business Information - Attachment

One to many attachments may accompany the request for information that is exchanged between the user and the supplier. This field is ***optional*** however when initiated requires several attributes. The first of these is the name of the attachment since there are multiples that may be attached and the comments provided should reference the appropriate one. The second is the file type which defines the method that may be used to read the data. The final attribute is the data file itself. (See also 9.1.7)

5.2 Product Information

The 175x series of standard is based on the concept of products (as defined in 3.1.4 of this document). A product object therefore is simply an identification of a product or group of products to which Sectional information is associated using the IPC-175x schema. The declaration **shall** contain one or more product objects. Each product object may represent one or more products as defined in the product ID fields (see Figure 5-2).

highlight this Product in Product Tree

Product | Homogeneous Material | Material Summary | Material Group | Query/Reply Material | Manufacturing Information

+	-	Prod Number	Prod Name	Mfr Prod Num...	Mfr Prod Name	Mfr Prod Versi...	Mfr Site	Effective Date	Amount	UOM	Unit Type	Identity	Authority
+	-												
+	-												
+	-												

Figure 5-2 Example of product object section as it may appear in an implementation, including multiple product IDs

Products within a product object may be identified using multiple product numbers or with a single product number representing an entire family of products. If a single product number is used to represent a family of products, requester and supplier are advised to clarify the correspondence between requester product identification and supplier product identification to ensure that supplier information associates correctly with requester product numbers.

Each product object **shall** require selection of specific Sectional information to be associated with it, such that the sectional information provided is true and correct for all members of the product object. Products included in each product object must therefore be chosen according to this principle. If products listed in a product object do not share Sectional information to be applied to them, then the product object **shall** be redefined so that only those products are included in the product object for which the Sectional information provided is true and correct. A new product object may be defined to address those products for which a different Sectional response is required. More than one IPC-175x Sectional may be associated with each product object.

By selecting from the Sectionals, a requester or supplier associates the mechanisms for providing information specific to those Sectionals as they pertain to the product or products identified according to this 1751 Sectional. By selecting “MaterialsInfo,” the 1752 Sectional is related to the 1751 information. If MaterialsInfo is selected, a selection of IPC-1752 Subsectionals is also required. By selecting “ManufacturingInfo,” the 1756 Sectional information is related to the 1751 information.

As stated above, the product object contains the identifying information and additionally contains the associated Sectionals, which the requester selects if in Request/Response mode or which the supplier chooses if in the Distribute mode.

The following fields provide information identifying each product object of interest.

5.2.1 Requester Product Number

This field identifies the requester’s number for each product included in the product object. In the request/response mode this field is ***mandatory***. The requester is cautioned to include only those product numbers for which requested Sectional information will be identical. A new product object may be defined for other products or product families for which a different Sectional response is anticipated. The first product number listed in the product object definition is the primary one for database structuring purposes as necessary in specific implementations of the required schema.

5.2.2 Requester Product Name

This field identifies the name of the each product in the requester’s system corresponding to each product number. This field is *optional.*

5.2.3 Manufacturer's Product Number

This field identifies the number for each product in the supplier's (manufacturer's) system as perceived by the requester. This field is ***mandatory***. In the Distribute mode the supplier provides the Manufacturer's Product Number.

5.2.4 Manufacturer's Product Name

This field identifies the name for each product in the supplier's (manufacturer's) system as perceived by the requester. This field is *optional.* In the Distribute mode the supplier provides this entry for each product number.

5.2.5 Manufacturer's Product Version

This field identifies the version of the product in the supplier's (manufacturer's) system as perceived by the requester. This field is *optional*. In the Distribute mode the supplier provides this entry for each product number.

5.2.6 Manufacturing Site

This field identifies the site at which the product is manufactured as perceived by the requester. This field is *optional*. In the Distribute mode the supplier provides this entry for each product number.

5.2.7 Effective Date

This field provides the date upon which the information provided in the 1751 Sectional, as well as accompanying information per any other 175x Sectional, became or becomes effective. This field is *optional*. If not provided, the effective date for all information provided is assumed to be the date of the response.

5.2.8 Instance ID

The Instance ID field is provided to allow either the requester or the supplier the means to further specify each product to which the declared information applies. That is, a requester may want to provide specific serial numbers of the products for which he is requesting a declaration, or a supplier may want to provide a SKU number, a lot code, a date code, an RFID number, etc. These would be entered in the Instance ID field. Instance IDs are associated with one particular product number only. The Instance ID field comes with a secondary field that is an optional open field to use in one-to-one correspondence with each Instance ID. There may be one or more Instance IDs associated with each product in a declaration. This field is *optional*.

5.2.9 Instance ID Authority

The Instance ID authority is the entity that issued the unique ID. It becomes ***mandatory*** only if there is an Instance ID. The authority may be defined as the supplier in the absence of any other assigning authority.

5.2.10 Product Amount

This field identifies the total amount of product mass in terms of a unit of measure and a value. This field is ***mandatory*** and is provided by the supplier whether in Request/Response mode or Distribute mode.

5.2.11 Unit of Measure (UoM)

This field identifies the unit of measure for the product mass – milligrams, grams, kilograms, parts per million, or mass percent. This field is ***mandatory***.

5.2.12 Unit Type

This field identifies the basis of quantification of the subject product or subproduct, the unit of product to which the associated mass (amount – UoM and value) applies. This field is called Unit Type to distinguish it from Unit of Measure. If the product is a discrete object, the Unit Type would be "Each." If the product is a potentially boundless material, such as a length of wire, a sheet of laminate, or a liquid, the unit type would be per meter (millimeter, centimeter), per square meter (square millimeter, centimeter), or per liter, respectively. Volume may be based on cubic linear units or liters. The Unit Type is intended to refer to the variable dimension of the product, where the other dimensions are assumed to be held constant and implied or specified elsewhere, as in the product or subproduct identification.

This field is ***mandatory***. In the Distribute mode, the supplier provides this information. The default value is per "Each." [Note: "Unit Type" is referred to as "Unit Volume" in the 175x Schema.]

5.2.13 Subproduct

A subproduct is a portion of a declared product. An example would be an integrated circuit in a printed circuit board assembly where the printed circuit board assembly is the primary product, or a subassembly in a computer where the computer is the primary product. Subproduct information **shall** consist of Mass, Unit of Measure, and Unit Type for every Subproduct Name.

The Subproduct function is intended to allow a supplier to declare the product according to the detail of their assembly structure as their engineering documentation or bill of materials defines it. Subproducts therefore would reflect the supplier's assembly levels as the supplier's product definition dictates. The IPC-175x schema does not limit the levels of subproducts allowed.

5.2.14 Number of Instances

The number of instances or occurrences of the subproduct within the parent product or subproduct. This field is ***mandatory*** for every subproduct named***,*** and the default value is 1. This field allows the supplier to state the quantity of each subproduct that occurs in the declared parent product or subproduct, such that when each subproduct quantity is multiplied by its mass and then the results for all subproducts are summed, the sum will theoretically equal the mass of the whole product.

5.3 Supplier Information

This information concerns the company and persons who are supplying a declaration document. Each field is described in more detail below; these are shown in the example in Figure 5-3.

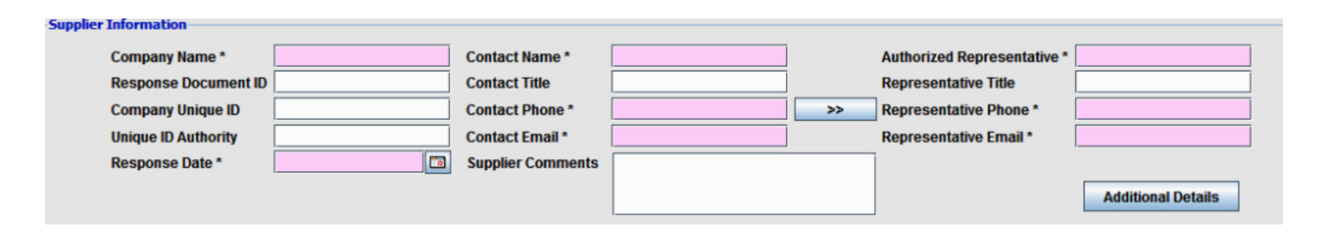


Figure 5-3 Example of Supplier Information Section
(Refer to Appendix A for field descriptors)

5.3.1 Company Information

5.3.1.1 Company Name

This field contains the legal name of the company supplying the declaration document. This field is ***mandatory***.

5.3.1.2 Company Unique ID

This field is used to uniquely identify the supplier. The DUNS number is an example of a unique ID. This field is *optional*.

5.3.1.3 Company Unique ID Authority

This field identifies the organization that assigns the unique ID. This field is ***mandatory*** if there is a Supplier Company Unique ID.

5.3.2 Response Status

5.3.2.1 Response Date

This field identifies the date of the supplier's response to the request for information. If the Distribute model is being used (see Section 7 BUSINESS PROCESS), this is the date when the data provided in the declaration is completed. This field is ***mandatory***.

5.3.2.2 Response Document ID

This field identifies the response in order to help the user and supplier reference communication. Establishing a revision method is recommended to identify different configurations of the same response. The methodology is as established by the supplier or the trading partners and may simply consist of a single letter or date code that establishes the appropriate linkage. This field is *optional*.

5.3.3 Contact Information

5.3.3.1 Contact Name

This field identifies the name of the person/role contact regarding the contents of the declaration information. This field is ***mandatory***.

5.3.3.2 Title – Contact

This field identifies the title of the contact. This field is *optional*.

5.3.3.3 Phone – Contact

This field identifies the telephone number for the contact. This field is ***mandatory***.

5.3.3.4 Email – Contact

This field identifies the email address for the contact. If an email address is not available, state “not available” or “n/a.” A blank field may cause an error in form implementation. This field is ***mandatory***.

5.3.4 Other Descriptions

5.3.4.1 Authorized Representative

This field identifies the person responsible for the content of the declaration. The authorized representative may be a different individual than the contact person. It is not correct to use the words “same” or similar identification to provide the name of the authorized representative. This field is ***mandatory***.

5.3.4.2 Title – Representative

This field identifies the title of the authorized representative. This field is *optional*.

5.3.4.3 Phone – Representative

This field identifies the phone number of the authorized representative. This field is ***mandatory***.

5.3.4.4 Email - Representative

This field identifies the email address of the authorized representative. If an email address is not available, state “not available” or “n/a”. A blank field may cause an error in form implementation. This field is ***mandatory***.

5.3.4.5 Supplier Comments or URL for Additional Information

This field contains additional information that may be provided which may include a URL pointing to more information. This field is *optional*.

5.4 Declaration Specifics

In some instances the declaration requires substantiation of the details provided in accordance with IPC-1751 and any of the Sectional standards. Although the fields are optional, they become ***mandatory*** when the requester requires verification of a commitment by the responding authority. In that instance the following paragraphs apply.

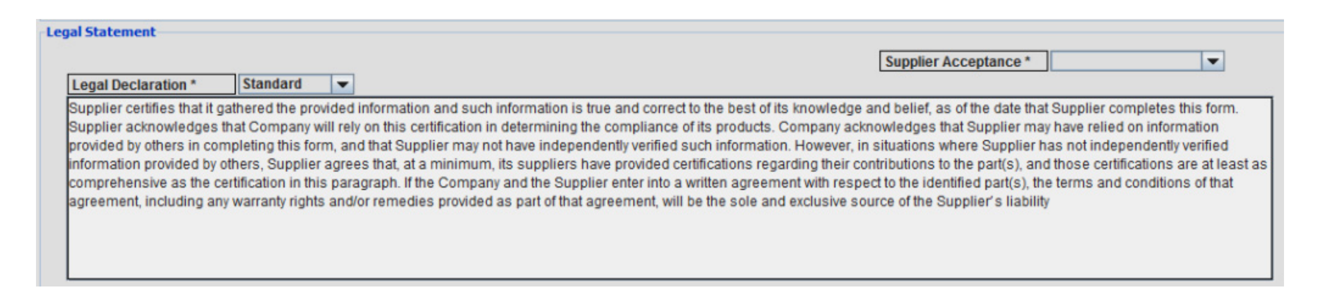
5.4.1 Commitment to the Data Provided in a Completed Declaration

Versions of the declaration forms may have been created to allow requesters to specify that the provided information requires substantiation and/or to specify that the information is true and correct to the best of the knowledge and belief of the supplier at the time the form was completed.

At the discretion of the company requesting the declaration (requester), the declaration may require substantiation of the details provided in accordance with IPC-1751 and any of the Sectional standards. In this situation, the supplier **shall** complete all the required fields in the document and designate an authorized representative of the company to sign the document to verify the commitment by the responding authority. Any disagreement regarding the statement terminology **shall** be mutually resolved between the two trading partners.

5.4.2 Legal Statement

For declarations which are published by the supplier, the supplier may provide a legal declaration which explains the extent to which the user may rely on the information provided in the declaration and which may limit liability. Requesters asking for data from a supplier may provide a similar legal statement which can be accepted or not accepted by the supplier. See Figure 5-4.


Legal Statement

Supplier Acceptance *

Legal Declaration * Standard

Supplier certifies that it gathered the provided information and such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part(s), and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part(s), the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability

Figure 5-4 Example of Legal Disclaimer, Supplier Acceptance and Attachment Fields

5.4.2.1 Standard

The standard legal statement follows:

> *"Supplier certifies that it gathered the provided information and such information is true and correct to the best of its knowledge and belief, as of the date that Supplier completes this form. Supplier acknowledges that Company will rely on this certification in determining the compliance of its products. Company acknowledges that Supplier may have relied on information provided by others in completing this form, and that Supplier may not have independently verified such information. However, in situations where Supplier has not independently verified information provided by others, Supplier agrees that, at a minimum, its suppliers have provided certifications regarding their contributions to the part(s), and those certifications are at least as comprehensive as the certification in this paragraph. If the Company and the Supplier enter into a written agreement with respect to the identified part(s), the terms and conditions of that agreement, including any warranty rights and/or remedies provided as part of that agreement, will be the sole and exclusive source of the Supplier's liability and the Company's remedies for issues that arise regarding information the Supplier provides in this form."*

5.4.2.2 Custom

A custom legal statement may be used if the standard statement cannot be used. In the request/response mode the requester will input the custom legal statement. In the Distribute mode suppliers may input a custom legal statement as well.

5.4.3 Supplier Signature

By signing and submitting a declaration, either digitally or in hard copy, the authorized representative signing the declaration is indicating acceptance of the legal statement as it applies to all of the data provided in the declaration. An XML file **shall** be signed with an XML signature conforming to the XML-Signature Syntax and Processing as defined in the W3C Recommendation (12 February 2002). This field is *optional*.

5.5 Uncertainty Statement

The supplier may provide information on the uncertainties associated with the data provided. This field is *optional*.

5.6 Attachments

The supplier may attach any substantiating data files to the declaration that explain or characterize the position of the declaration descriptions. In many instances an attachment would be specifically related to the Sectional standard which is used in combination with the generic information. Attachments are *optional*.

6 DATA MODEL

A model is a simplified representation of a system that ignores extraneous details in order to concentrate on some particular aspect of the system; UML was chosen to represent this information system. An information model is an abstract view of a system that specifies and describes the information used by the system. The most useful information models describe constraints on information and relationships between information, in addition to the structure of the information. Machine readability is a desirable feature of an information model, which makes it much more useful for automation.

6.1 Machine Readable Formats

Ideally, a machine-readable information model would be programmatically converted into:

- The grammars necessary to transport information
- Skeletal computer code used to manipulate information
- The Structured Query Language (SQL) statements necessary to define the structure of relational databases that store information
- Database stored procedures used to ensure the validity of the data.

6.2 Data Model for Declaration

The data model for a generic declaration standard is not complex; however, there are many relationships and linkages that need to be addressed and established. Data modeling can improve the characteristics of any form or any programming that is developed at the requester's site or the supplier's location. See Figure 6-1.

Appendix B shows the characteristics of the UML model for the generic standard. This information will be continually evaluated and modified as the standard evolves and gains consensus.

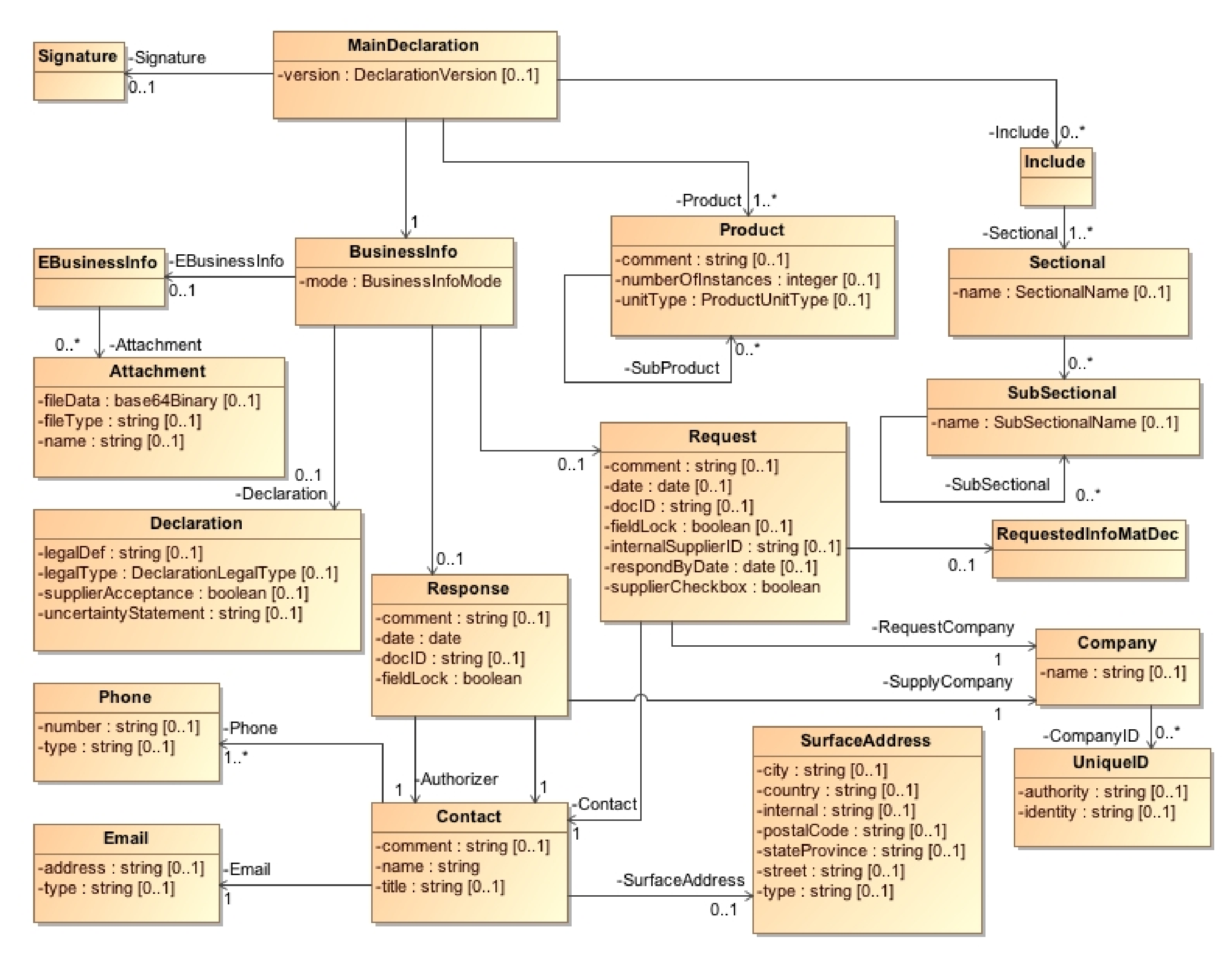


Figure 6-1 1751 Business Information Design Data Model

6.3 Methods of Using UML

There are three modes for using UML; one is as a sketch of the desired process, another is as a blueprint for developing details, and the third is a very detailed entry into the programming language. The most common is that of sketching out the ideas and relationship for a particular model. In many instances a data modeler goes through several iterations in order to satisfy the developing team's needs.

The most important part of the modeling sequence is the development of the analytical model. See Appendix B for a full Declaration Analytical Model. The data model for a single product explores all the ramifications of the intended descriptions. Figure 6-2 shows an example of the analytical model for an electronic assembly. Once the analytical model is developed it can be converted to a design model as appropriate. The design model becomes very specific as to the intent and the method of model implementation.

In the declaration management standard, there are several analytical models that **shall** be developed in order to cover the various details of the model implementation strategy. These are then used to develop the design model. The data model is shown in Figure 6-2. This data model describes the information necessary to be captured in a data instance, and may be used to develop software tools that facilitate data transfer.

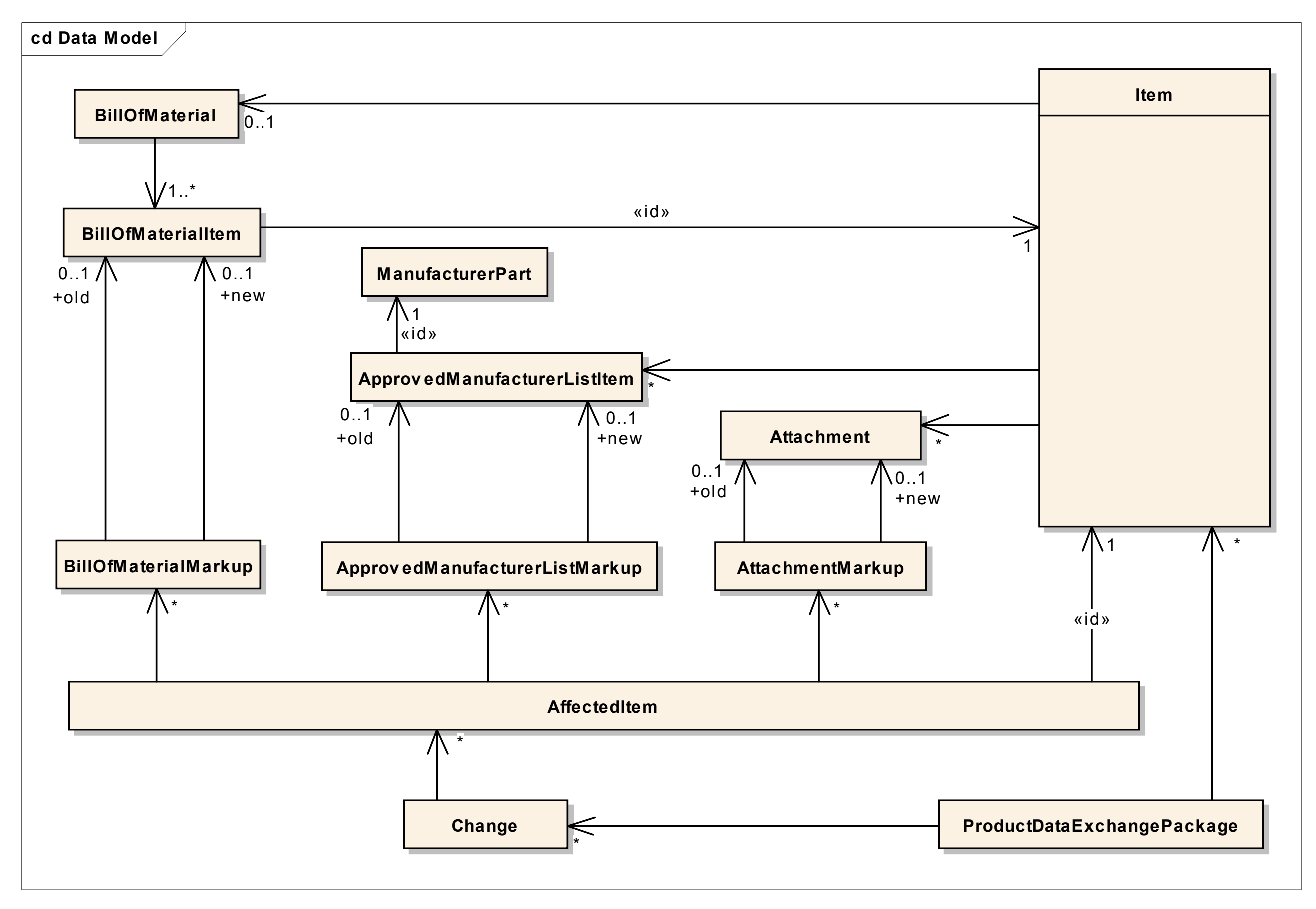


Figure 6-2 Analytical Model of a Product that is Part of an Electronic Assembly

7 BUSINESS PROCESS

This section discusses the business interactions supported by the IPC-175x declaration process.

7.1 Request/Response (Pull)

Requests for information can come from customers, regulators, non-governmental organizations (NGOs), or the public. The request may be part of a procurement contract or request for quote/information, or may simply be a request for data. Any ambiguity in the request should be clarified. Specific information about the request may be attached to the request or may be provided on a web page which is described in the request.

The company receiving the request (defined as the supplier) should then decide whether to respond to the request.

The response to the request will depend on the requested transmission format described by the requester. The response **shall** follow the IPC-1751 generic standard and the appropriate Sectional information related to the declaration activity. The report/declaration should then be sent to the requester.

7.2 Distribute (Push)

Another process of distributing the declaration information and the appropriate Sectional content is to publish it for distribution. This most often will be accomplished by making documents available on a corporate web site, or having them available internally for submission to a requester when a request is received. In this latter case, it will be important that the information in the requester fields be included with the response. These fields contain information that the requester needs to be able to systematically tie the response to the request.

Under this process the format for generic information is combined with the requirements of the appropriate Sectional information and then published as a unique description related to a specific product or products. The publication **shall** follow the IPC-1751 generic standard and the appropriate Sectional information related to the declaration activity.

8 VERIFICATION

Verification involves ensuring that the information provided is accurate. Verification of declared information has a number of different aspects, described below. Since this generic standard deals with company information, additional requirements for verification are included in the Sectional standards.

Each supplier or producer **shall** be responsible for determining the level of verification appropriate to their operations.

If a requester Product Number and/or Manufacturer Product Number is not recognized by the supplier, this information must be resolved between the supplier and requester outside of the 1751 standard.

8.1 Validation

Validation of the company information contained in any declaration is straightforward and is often done systematically. Validation is the first step of any verification process, and involves checking that the data provided is of the correct type. For instance, if email addresses are provided, they should be in the correct form and contain an @ symbol, all dates must be in an approved date format, and names use characters rather than numbers, etc. At a minimum, any 175x file should be valid when compared to the IPC-175x XML schema.

8.2 Confirmation

After checking that data exchanged between trading partners is valid as described above, it is also important to check that the data is correct. Contact personnel, as well as their phone numbers, email and other information (as appropriate given the business need), should be established and kept up-to-date. Sometimes confirmation of information can be performed programmatically, such as comparing company names in the requester and supplier fields against information in the Company ID for the Manufacturer field, or comparing contact information provided by the supplier against supplier contact information in the requester’s systems.

If the requester has specific instructions for the supplier, they may be provided through a hyperlink to a web page or with the request as an attachment. The requester may wish to confirm that the supplier has followed these instructions, particularly any specific instructions concerning the role of the authorizing person.

8.3 Audit

An additional level of verification consists of an audit of the supplier by the requester, a third party, or a supplier self-audit. Supplier audits are optional, although audit conditions are often described in the original business agreement between trading partners. The confidence level between trading partners largely determines the need for or frequency of audits. Because this generic standard deals with company information, a separate audit to verify this information will seldom be warranted. Requesters may wish to incorporate verification of how suppliers document this information within existing audit protocols.

9 IMPLEMENTATION GUIDELINES

9.1 Functional Requirements

This section describes function requirements for any IPC-175x compliant software tools.

9.1.1 Operating System

Any operating system may be used.

9.1.2 Platform

The software platform used to generate or view a 175x XML file is unspecified and may be selected by the application developer; for instance, Excel, Word, Acrobat, Open Source, proprietary, or other platform may be used.

9.1.3 File Upload and Export

The software tool **shall** be able to import and export 175x series XML data files. The software tool should be able to merge multiple XML data files so that modules can be combined. For example, an XML file may be provided by the requester and response data provided by the supplier in request/reply mode, or separate 1752 and 1756 data files for the same product may be combined into a single declaration. The software may be a stand-alone data editing program or it may be part of a data management system.

Optionally, should a supplier not be able to respond via XML or have software available to them to respond electronically, the supplier may provide the requested data in hard copy human readable form if acceptable to the requester.

9.1.4 Field Locking

Data inputs into a field must be 'lockable' to ensure the integrity of the data provided by both parties. The lock provides a flag in the XML file that **shall** be used by the software to determine whether certain fields are editable. The lock should operate so that the Requester can create an XML file with data they do not want changed, and then lock only those fields. Similarly, the Supplier should be able to lock their provided data to ensure its integrity.

9.1.5 Electronic Signature

An electronic signature **shall** be provided as a user option for validating the source of the information and to lock the electronic file from tampering. The software **shall** support the application and validation of XML Signature, as defined by the W3 Organization (http://www.w3.org/TR/xmldsig-core/).

9.1.6 Schema Validation

Validation involves ensuring that the data provided are of the correct type. This is done by using an XML parser to compare the XML file being validated against the XML schema. Requesters are encouraged to systematically validate data where possible to reduce the required verification effort. This can be accomplished through drop-down menus, click-boxes, radio buttons and logic which ensure that names are all characters, weights are numeric, etc. It is recommended that supporting tools provide data validation when an XML instance is created. Systems receiving materials data can also be set up to validate incoming data.

9.1.7 Data Attachments

Users **shall** be able to attach additional data files, such as laboratory test reports. The data will be included in the XML file.

9.2 Additional Functionality

This section describes additional suggested functionality for IPC-175x software.

9.2.1 Data Validation

It may be desirable to perform additional validation beyond schema validation. For example, substance weights could be summed and compared to the product weight.

9.2.2 Additional Information Via Hyperlink

Requesters or responders may wish to provide a hyperlink to additional information such as additional instructions for form completion, product information, etc.

9.2.3 Submit by E-mail

This option would permit suppliers to submit completed declarations via email.

9.2.4 B2B Gateway

This option would allow companies to establish direct business to business data exchange.

9.2.5 Excel Data Import

This option would allow an excel data file to be mapped to the XML schema.

9.2.6 Contact Information Duplication

In this option, where the same personnel data is used to complete multiple contact fields, it may be desirable to allow a simple button to duplicate or repeat contact information.

9.3 Presentation Output

The following information outlines the general system features requirements for a printable, human readable output of the IPC-1752 module within the 175x series. For each module there is a mapping between the XML Schema attribute to the printable title of the attribute’s Presentation field.

A report **shall** consist of a 1751 module section and any other selected modules.

Presentation Fields:

The printable output **shall** adhere to the rules of the XML Schema and the field Title information provided in the Attribute's Map.

9.3.1 1751 Rules to Extend Schema Constraints

Rule 1: If data is sent from a Requester to the Supplier in the Request/Reply mode, then the requester business information must be provided. If <BusinessInfo mode="Request/Reply"> then a <Request> within <BusinessInfo> is required.

Rule 2: If data is sent directly from the Supplier in the Distribute mode, then the Requester information shall not exist. If <BusinessInfo mode="Distribute"> then a <Request> within <BusinessInfo> shall not exist.

Rule 3: The mass of a product shall only be in the unit of measure (UoM) of milligram, gram, or kilogram.

Rule 4: A product shall not contain a numberOfInstances attribute (product quantity by definition is one only), where a subproduct may have a numberOfInstances attribute. The default value is 1.

Rule 5: A <Product> element shall not contain a numberOfInstances attribute.

9.3.2 Multiple Pages

Multiple page documents **shall** include a document identification number and a sequential page number on each page.

Appendix A
Generic Presentation Description

The following is an illustration that shows an example of a PDF form which relates to general company information. The graphic shows both the company information for the requester and the company information for the supplier.

These fields will be modified to reflect the needs of IPC-1752, IPC-1753, IPC-1754, and so forth as they are developed. The data fields will be consistent with the needs of those standards and each will have their unique descriptions appended to the requester and supplier information fields.

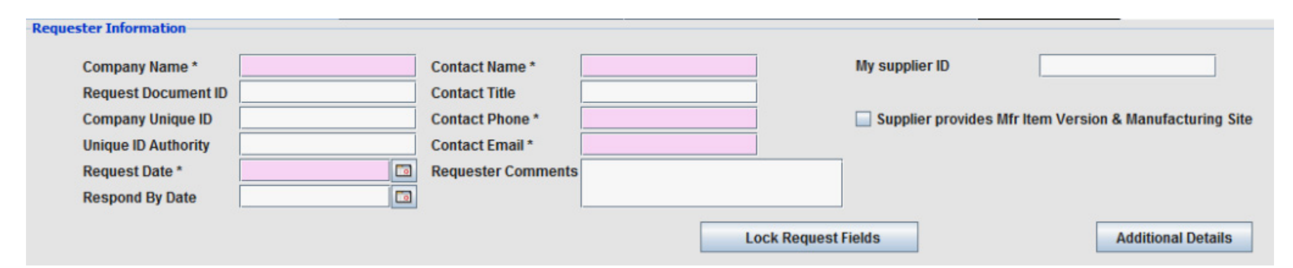


Figure A-1 Example of how a Requester Information Section might appear in an Implementation

Table A-1 Field Attributes of Requester Information Section

Xsd element	Parent	Element attribute	Display Field Name	M/O*	Add'l Information for Solution Providers
Request	BusinessInfo	Date	Request Date	M	
Request	BusinessInfo	docID	Request Document ID	O	
Request	BusinessInfo	comment	Requester Comments	O	
Request	BusinessInfo	respondByDate	Respond By Date	O	
Request	BusinessInfo	internalSupplierID	My supplier ID	O	
Request	BusinessInfo	supplierCheckbox	Supplier provides Mfr. Item Version and Manufacturing Site	O	checkbox
Request	BusinessInfo	fieldLock	Lock Request Fields	M	checkbox or button
UniqueID	Company	Identity	Company Unique ID	O	
UniqueID	Company	Authority	Unique ID Authority	O	
Phone	Contact	Number	Contact Phone	M	
Email	Contact	Address	Contact Email	M	
SurfaceAddress	Contact	internal	Internal	O	Additional
SurfaceAddress	Contact	street	Street	O	Additional
SurfaceAddress	Contact	city	City	O	Additional
SurfaceAddress	Contact	stateProvince	State	O	Additional
SurfaceAddress	Contact	country	Country	O	Additional
SurfaceAddress	Contact	postalCode	Zip Code	O	Additional
Company	Request	name	Company Name	M	
Contact	Request	name	Contact Name	M	
Contact	Request	title	Contact Title	O	
Contact	Request	Comment	Contact Comments	O	

*M=Mandatory; O=Optional

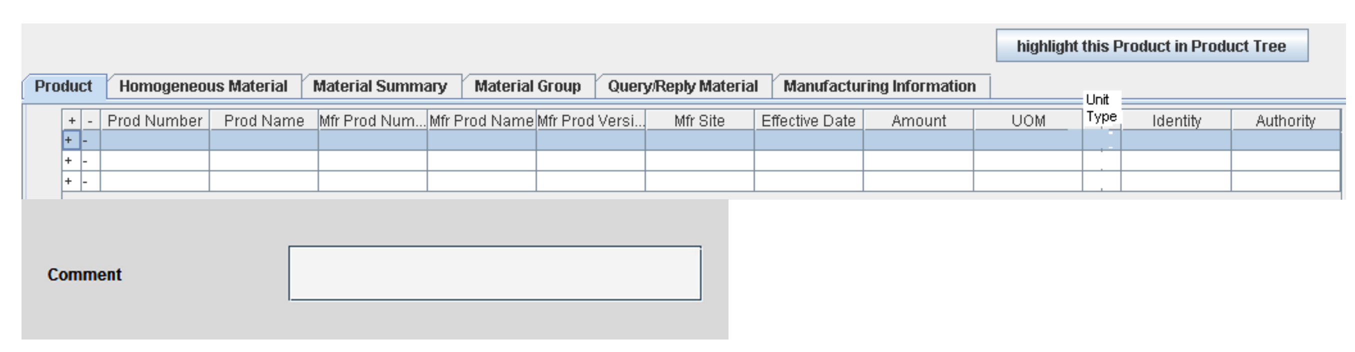


Figure A-2 Example of Product Information Section as it may appear in an Implementation

Table A-2 Field Attributes of Product Information Section

Xsd element	Parent	Element attribute	Display Field Name	M/O*	Add'l Information for Solution Providers
ProductID	Product	requesterItemName	Requester Item Name	O	ProductID section
ProductID	Product	requesterItemNumber	Requester Item Number	O	ProductID section
ProductID	Product	effectiveDate	Effective Date	O	ProductID section
ProductID	Product	itemName	Mfr Item Name	O	ProductID section
ProductID	Product	itemNumber	Mfr Item Number	M	ProductID section
ProductID	Product	manufacturingSite	Mfr Site	O	ProductID section
ProductID	Product	version	Version	O	ProductID section
Product	MainDeclaration	unitType	Unit type	M	
Product	MainDeclaration	comment	Comment	O	
Amount	ProductID	value	Mass	M	ProductID section
Amount	ProductID	UOM	UoM	M	ProductID section

*M=Mandatory; O=Optional

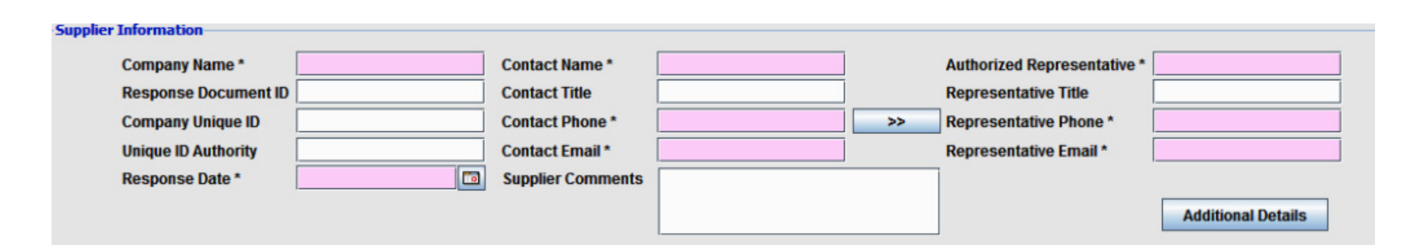


Figure A-3 Example of Supplier Information Section

Table A-3 Field Attributes of Supplier Information Section

Xsd element	Parent	Element attribute	Display Field Name	M/O*	Add'l Information for Solution Providers
Response	BusinessInfo	docID	Response Document ID	O	
Response	BusinessInfo	date	Response Date	M	
Response	BusinessInfo	Comment	Supplier Comments	O	
UniqueID	Company	Identity	Company Unique ID	O	
UniqueID	Company	authority	Unique ID Authority	O	
Contact	Response	Name	Contact Name	M	
Contact	Response	Title	Contact Title	O	
Phone	Contact	number	Contact Phone	M	
Email	Contact	Address	Contact Email	M	
SurfaceAddress	Contact	internal	Internal	O	Additional Contact Info
SurfaceAddress	Contact	street	Street	O	Additional Contact Info
SurfaceAddress	Contact	city	City	O	Additional Contact Info
SurfaceAddress	Contact	stateProvince	State	O	Additional Contact Info
SurfaceAddress	Contact	country	Country	O	Additional Contact Info
SurfaceAddress	Contact	postalCode	Zip Code	O	Additional Contact Info
Phone	Contact	number	Representative Phone	M	Authorized Representative section
Email	Contact	address	Representative Email	M	Authorized Representative section
AlternateItem	Product	comments	Supplier Comments	O	
Company	Response	Name	Company Name	M	
Authorizer	Response	Name	Contact Name	M	Authorizer Info section
Authorizer	Response	Title	Contact Title	O	
Authorizer	Response	Name	Authorized Representative	M	
SurfaceAddress	Authorizer	internal	Internal	O	Additional Authorizer Info
SurfaceAddress	Authorizer	street	Street	O	Additional Authorizer Info
SurfaceAddress	Authorizer	city	City	O	Additional Authorizer Info
SurfaceAddress	Authorizer	stateProvince	State	O	Additional Authorizer Info
SurfaceAddress	Authorizer	country	Country	O	Additional Authorizer Info
SurfaceAddress	Authorizer	postalCode	Zip Code	O	Additional Authorizer Info
Authorizer	Response	title	Representative Title	O	

*M=Mandatory; O=Optional

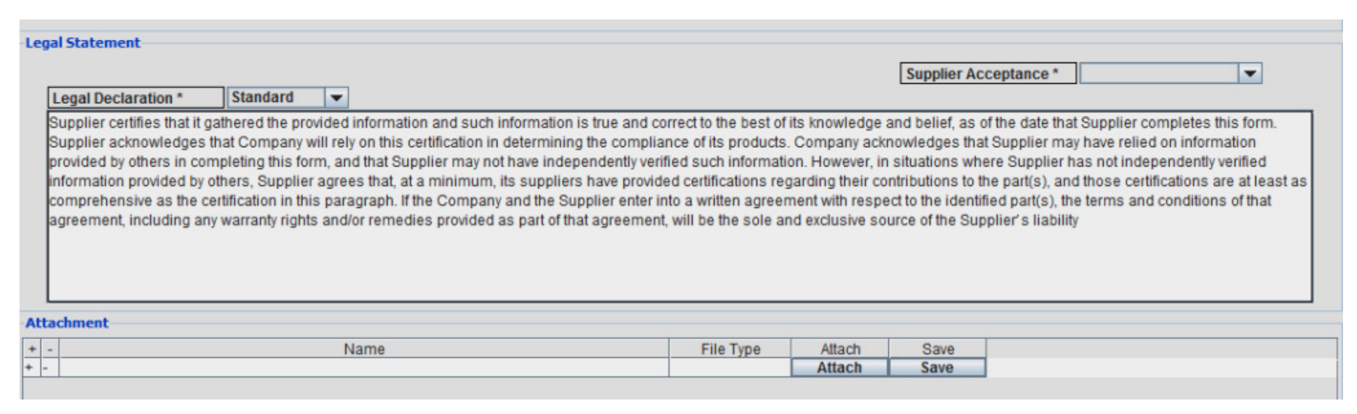


Figure A-4 Example of Legal Disclaimer, Supplier Acceptance and Attachment Fields

Table A-4 Field Attributes of Supplier Acceptance and Attachment Section

Xsd element	Parent	Element attribute	Display Field Name	M/O*	Add'l Information for Solution Providers
Declaration	BusinessInfo	legalType	Legal Declaration	M	
Declaration	BusinessInfo	supplierAcceptance	Supplier Acceptance	M	
Declaration	BusinessInfo	legalDef	None - associate with legal statement field	M	
Declaration	BusinessInfo	uncertaintyStatement	Uncertainty Statement	O	
Attachment	EBusinessInfo	name	Name	O	
Attachment	EBusinessInfo	fileType	File Type	O	

*M=Mandatory; O=Optional

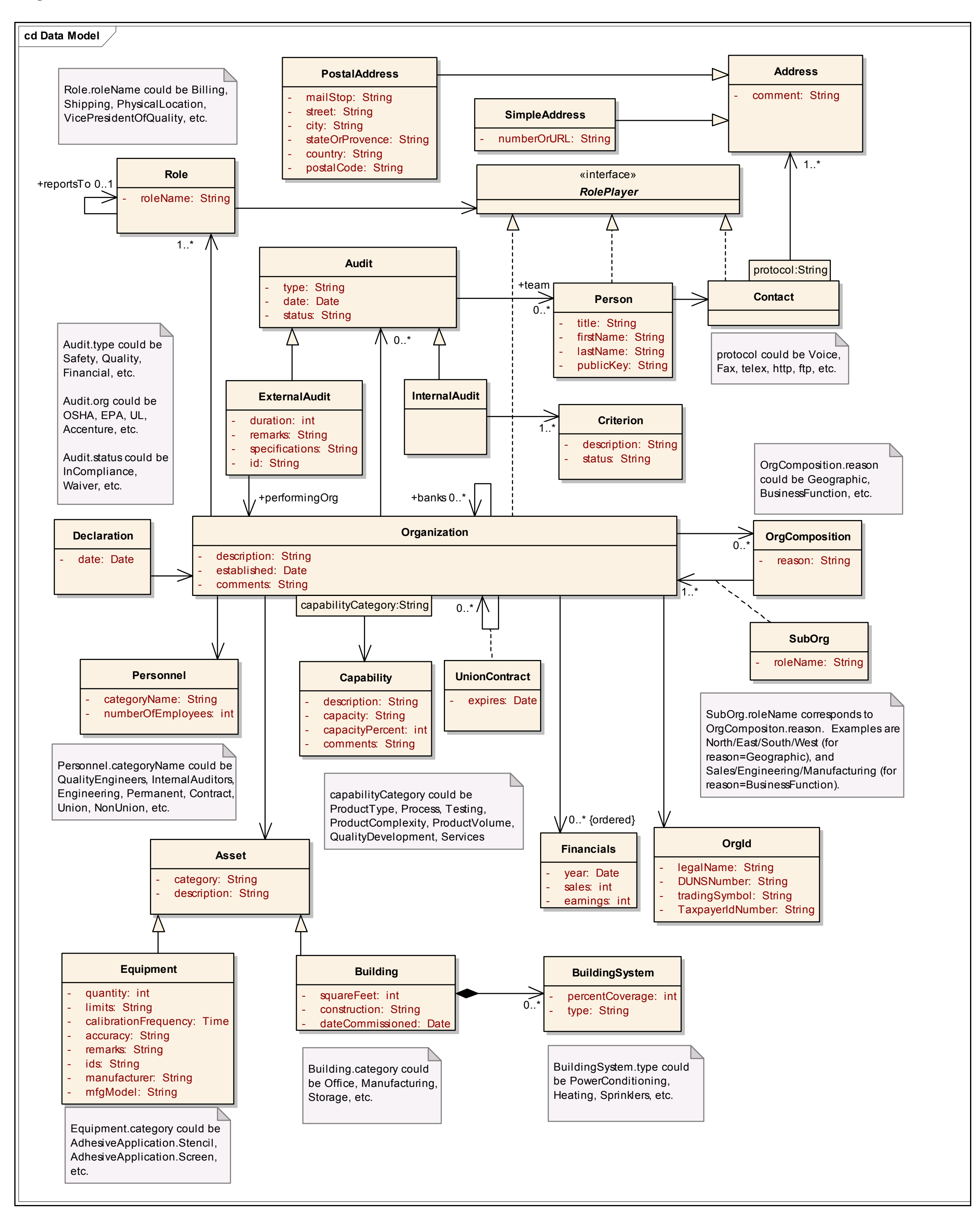
Table A-5 Example of Form Type, Version, Sectional/Subsectional Field Names

Xsd element	Parent	Element attribute	Display Field Name	M/O*	Add'l Information for Solution Providers
BusinessInfo	MainDeclaration	mode	Form Type	M	
MainDeclaration		version	Version	M	read only
Sectional	Include	name	Sectionals	M	
Subsectional	Sectional	name	SubSectionals	O	

*M=Mandatory; O=Optional

Appendix B
Declaration Analytical Model

The following illustration is an example of a declaration analytical model intended to represent any of the IPC-175X family of standards. It consists of various elements and attributes necessary for trading partner information exchange.



Appendix C
Previous Versions of IPC-175X

Versions 1.0 and 1.2:

IPC-1751 *Generic Requirements for Declaration Process Management*

IPC-1752 *Sectional Requirements for Material Declaration Management*

IPC-1752-1 *Material and Substance Declaration Description Form – Class 1, 2, 3, and 4*

IPC-1752-2 *Material and Substance Declaration Description Form – Class 1, 2, 5 and 6*

IPC-1752-3 *Material and Substance Declaration Description Users Guide*

Appendix D
175X XML Schema


```xml
<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:ds="http://www.w3.org/2000/09/xmldsig#"
xmlns="http://webstds.ipc.org/175x/2.0" targetNamespace="http://webstds.ipc.org/175x/2.0" elementFormDefault="qualified">
  <xsd:element name="MainDeclaration" type="MainDeclaration"/>
  <xsd:complexType name="MainDeclaration">
    <xsd:sequence>
      <xsd:element name="BusinessInfo" type="BusinessInfo"/>
      <xsd:element name="Include" type="Include" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="Product" type="Product" maxOccurs="unbounded"/>
      <xsd:element name="Signature" type="Signature" minOccurs="0"/>
    </xsd:sequence>
    <xsd:attribute name="version">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="2.0"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
  <xsd:complexType name="Request">
    <xsd:sequence>
      <xsd:element name="Contact" type="Contact" minOccurs="1" maxOccurs="1"/>
      <xsd:element name="RequestCompany" type="Company"/>
      <xsd:element name="RequestedInfoMatDec" type="RequestedInfoMatDec" minOccurs="0"/>
    </xsd:sequence>
    <xsd:attribute name="date" type="xsd:date" use="required"/>
    <xsd:attribute name="docID" type="xsd:string"/>
    <xsd:attribute name="comment" type="xsd:string"/>
    <xsd:attribute name="respondByDate" type="xsd:date"/>
    <xsd:attribute name="internalSupplierID" type="xsd:string"/>
    <xsd:attribute name="fieldLock" type="xsd:boolean"/>
    <xsd:attribute name="supplierCheckbox" type="xsd:boolean" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="Contact">
    <xsd:sequence>
      <xsd:element name="Email" type="Email"/>
      <xsd:element name="SurfaceAddress" type="SurfaceAddress" minOccurs="0"/>
      <xsd:element name="Phone" type="Phone" maxOccurs="unbounded" />
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string" use="required"/>
    <xsd:attribute name="title" type="xsd:string"/>
    <xsd:attribute name="comment" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="UniqueID">
    <xsd:sequence/>
    <xsd:attribute name="identity" type="xsd:string"/>
    <xsd:attribute name="authority" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="UniqueIDExtended">
    <xsd:complexContent>
    <xsd:extension base="UniqueID">
      <xsd:attribute name="revision"/>
    </xsd:extension>
    </xsd:complexContent>
  </xsd:complexType>
  <xsd:complexType name="ProductID">
    <xsd:sequence>
      <xsd:element name="Amount" type="Amount" minOccurs="0"/>
      <xsd:element name="InstanceID" type="UniqueID" minOccurs="0" maxOccurs="unbounded"/>
```

```
    </xsd:sequence>
    <xsd:attribute name="itemName" type="xsd:string"/>
    <xsd:attribute name="itemNumber" type="xsd:string"/>
    <xsd:attribute name="manufacturingSite" type="xsd:string"/>
    <xsd:attribute name="effectiveDate" type="xsd:date"/>
    <xsd:attribute name="version" type="xsd:string"/>
    <xsd:attribute name="requesterItemName" type="xsd:string"/>
    <xsd:attribute name="requesterItemNumber" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Product">
    <xsd:sequence>
      <xsd:element name="ProductID" type="ProductID" maxOccurs="unbounded"/>
      <xsd:element name="MaterialInfo" type="MaterialInfo" minOccurs="0"/>
      <xsd:element name="ManufacturingInfo" type="ManufacturingInfo" minOccurs="0"/>
      <xsd:element name="SubProduct" type="Product" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="unitType">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="Each"/>
          <xsd:enumeration value="Meter"/>
          <xsd:enumeration value="m^2"/>
          <xsd:enumeration value="m^3"/>
          <xsd:enumeration value="cm"/>
          <xsd:enumeration value="cm^2"/>
          <xsd:enumeration value="cm^3"/>
          <xsd:enumeration value="Liter"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="comment" type="xsd:string"/>
    <xsd:attribute name="numberOfInstances" type="xsd:integer"/>
  </xsd:complexType>
  <xsd:complexType name="Substance">
    <xsd:sequence>
      <xsd:element name="SubstanceID" type="UniqueID" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="Amount" type="Amount" minOccurs="0"/>
      <xsd:element name="Concentration" type="Concentration" minOccurs="0"/>
      <xsd:element name="SubstanceExemption" type="Exemption" minOccurs="0"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="comment" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Response">
    <xsd:sequence>
      <xsd:element name="Authorizer" type="Contact"/>
      <xsd:element name="SupplyCompany" type="Company"/>
      <xsd:element name="Contact" type="Contact"/>
    </xsd:sequence>
    <xsd:attribute name="date" type="xsd:date" use="required"/>
    <xsd:attribute name="docID" type="xsd:string"/>
    <xsd:attribute name="fieldLock" type="xsd:boolean" use="required"/>
    <xsd:attribute name="comment" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Company">
    <xsd:sequence>
      <xsd:element name="CompanyID" type="UniqueID" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string" use="required"/>
  </xsd:complexType>
  <xsd:complexType name="Threshold">
    <xsd:attribute name="overThreshold" type="xsd:boolean"/>
```

```
    <xsd:attribute name="threshold" type="xsd:string"/>
    <xsd:attribute name="intentionallyAdded" type="xsd:boolean"/>
  </xsd:complexType>
  <xsd:complexType name="Declaration">
    <xsd:attribute name="legalType">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="Standard"/>
          <xsd:enumeration value="Custom"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="supplierAcceptance" type="xsd:boolean"/>
    <xsd:attribute name="legalDef" type="xsd:string"/>
    <xsd:attribute name="uncertaintyStatement" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Amount">
    <xsd:attribute name="UOM">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="mg"/>
          <xsd:enumeration value="g"/>
          <xsd:enumeration value="kg"/>
          <xsd:enumeration value="ppm"/>
          <xsd:enumeration value="massPercent"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="value" type="xsd:float"/>
  </xsd:complexType>
  <xsd:complexType name="Concentration">
    <xsd:attribute name="value" type="xsd:float"/>
  </xsd:complexType>
  <xsd:complexType name="HomogeneousMaterial">
    <xsd:sequence>
      <xsd:element name="Amount" type="Amount"/>
      <xsd:element name="SubstanceCategoryList" type="SubstanceCategoryList" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="comment" type="xsd:string"/>
    <xsd:attribute name="materialGroupName" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="SubstanceCategory">
    <xsd:sequence>
      <xsd:element name="Amount" type="Amount" minOccurs="0"/>
      <xsd:element name="Substance" type="Substance" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="Threshold" type="Threshold" minOccurs="0"/>
      <xsd:element name="SubstanceCatExemptionList" type="ExemptionList" minOccurs="0"/>
      <xsd:element name="Concentration" type="Concentration" minOccurs="0"  maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="comment" type="xsd:string"/>
    <xsd:attribute name="descriptionOfUse" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="ExemptionList">
    <xsd:sequence>
      <xsd:element name="ExemptionListID" type="UniqueID"/>
      <xsd:element name="Exemption" type="Exemption" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="Exemption">
    <xsd:attribute name="identity" type="xsd:string"/>
```

```
    <xsd:attribute name="description" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Attachment">
    <xsd:attribute name="name" type="xsd:string"/>
    <xsd:attribute name="fileType" type="xsd:string"/>
    <xsd:attribute name="fileData" type="xsd:base64Binary"/>
  </xsd:complexType>
  <xsd:complexType name="Internal">
    <xsd:attribute name="identity" type="xsd:string"/>
    <xsd:attribute name="source" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="MaterialInfo">
    <xsd:sequence>
      <xsd:element name="ExemptionList" type="ExemptionList" minOccurs="0"/>
      <xsd:element name="QueryList" type="QueryList" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="MaterialGroupList" type="MaterialGroupList" minOccurs="0" maxOccurs="1"/>
      <xsd:element name="SubstanceCategoryList" type="SubstanceCategoryList" minOccurs="0" maxOccurs="unbounded"/>
      <xsd:element name="HomogeneousMaterialList" type="HomogeneousMaterialList" minOccurs="0" maxOccurs="1"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="BusinessInfo">
    <xsd:sequence>
      <xsd:element name="Response" type="Response" minOccurs="0"/>
      <xsd:element name="Request" type="Request" minOccurs="0"/>
      <xsd:element name="Declaration" type="Declaration" minOccurs="0"/>
      <xsd:element name="EBusinessInfo" type="EBusinessInfo" minOccurs="0"/>
    </xsd:sequence>
    <xsd:attribute name="mode" use="required">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="Distribute"/>
          <xsd:enumeration value="Request/Reply"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
  <xsd:complexType name="QueryList">
    <xsd:sequence>
      <xsd:element name="Query" type="Query" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="identity" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Query">
    <xsd:attribute name="statement" type="xsd:string"/>
    <xsd:attribute name="response" type="xsd:boolean"/>
  </xsd:complexType>
  <xsd:complexType name="EBusinessInfo">
    <xsd:sequence>
      <xsd:element name="Attachment" type="Attachment" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ManufacturingInfo">
    <xsd:sequence>
      <xsd:element name="Package" type="Package"/>
    </xsd:sequence>
    <xsd:attribute name="comment" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="Package">
    <xsd:sequence>
      <xsd:element name="Solder" type="Solder"/>
      <xsd:element name="Terminal" type="Terminal" maxOccurs="unbounded"/>
      <xsd:element name="PSLRating" type="PSLRating" maxOccurs="1" minOccurs="1"/>
```

```
    </xsd:sequence>
    <xsd:attribute name="mslRating">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="1"/>
          <xsd:enumeration value="2"/>
          <xsd:enumeration value="2a"/>
          <xsd:enumeration value="3"/>
          <xsd:enumeration value="4"/>
          <xsd:enumeration value="5"/>
          <xsd:enumeration value="5a"/>
          <xsd:enumeration value="6"/>
          <xsd:enumeration value="NAC"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="classificationTemp" type="xsd:float"/>
    <xsd:attribute name="maxTimeWithin5" type="xsd:float"/>
    <xsd:attribute name="componentRampUpRate" type="xsd:float"/>
    <xsd:attribute name="packageDesignator">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="AXL"/>
          <xsd:enumeration value="BGA"/>
          <xsd:enumeration value="CGA"/>
          <xsd:enumeration value="CHP"/>
          <xsd:enumeration value="DIM"/>
          <xsd:enumeration value="DIP"/>
          <xsd:enumeration value="DSO"/>
          <xsd:enumeration value="DSB"/>
          <xsd:enumeration value="LGA"/>
          <xsd:enumeration value="PGA"/>
          <xsd:enumeration value="QFF"/>
          <xsd:enumeration value="QFJ"/>
          <xsd:enumeration value="QFN"/>
          <xsd:enumeration value="QFP"/>
          <xsd:enumeration value="RAD"/>
          <xsd:enumeration value="SIM"/>
          <xsd:enumeration value="SIP"/>
          <xsd:enumeration value="SMC"/>
          <xsd:enumeration value="SMO"/>
          <xsd:enumeration value="SOF"/>
          <xsd:enumeration value="SOJ"/>
          <xsd:enumeration value="SON"/>
          <xsd:enumeration value="SOT"/>
          <xsd:enumeration value="SVP"/>
          <xsd:enumeration value="THC"/>
          <xsd:enumeration value="THO"/>
          <xsd:enumeration value="UCI"/>
          <xsd:enumeration value="WLB"/>
          <xsd:enumeration value="ZIP"/>
          <xsd:enumeration value="NAC"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="preheatMinTemp" type="xsd:float"/>
    <xsd:attribute name="preheatMaxTemp" type="xsd:float"/>
    <xsd:attribute name="preheatDuration" type="xsd:float"/>
    <xsd:attribute name="componentTempSpike" type="xsd:float"/>
    <xsd:attribute name="timeAbove217" type="xsd:float"/>
    <xsd:attribute name="componentRampDownRate" type="xsd:float"/>
  </xsd:complexType>
```

```
<xsd:complexType name="Solder">
  <xsd:attribute name="numberProcessingCycles">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="1"/>
        <xsd:enumeration value="2"/>
        <xsd:enumeration value="3"/>
        <xsd:enumeration value="4"/>
        <xsd:enumeration value="5"/>
        <xsd:enumeration value="6"/>
        <xsd:enumeration value="7"/>
        <xsd:enumeration value="8"/>
        <xsd:enumeration value="9"/>
        <xsd:enumeration value="10"/>
        <xsd:enumeration value="NAC"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:attribute>
  <xsd:attribute name="maxWaveSolderTemp" type="xsd:float"/>
  <xsd:attribute name="maxTotalWaveTime" type="xsd:float"/>
</xsd:complexType>
<xsd:complexType name="Terminal">
  <xsd:attribute name="shape">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="Bulk solder"/>
        <xsd:enumeration value="C bend"/>
        <xsd:enumeration value="Solder lug"/>
        <xsd:enumeration value="Flat"/>
        <xsd:enumeration value="Gull wing"/>
        <xsd:enumeration value="High-current cable"/>
        <xsd:enumeration value="Insulated"/>
        <xsd:enumeration value="J bend"/>
        <xsd:enumeration value="L bend"/>
        <xsd:enumeration value="No lead"/>
        <xsd:enumeration value="Pin"/>
        <xsd:enumeration value="Quick connect"/>
        <xsd:enumeration value="Wraparound"/>
        <xsd:enumeration value="S bend"/>
        <xsd:enumeration value="Through-hole"/>
        <xsd:enumeration value="J inverted"/>
        <xsd:enumeration value="Wire"/>
        <xsd:enumeration value="Screw"/>
        <xsd:enumeration value="NAC"/>
      </xsd:restriction>
    </xsd:simpleType>
  </xsd:attribute>
  <xsd:attribute name="size" type="xsd:float"/>
  <xsd:attribute name="numberOfInstances" type="xsd:integer"/>
  <xsd:attribute name="terminalBaseAlloy">
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="Alloy 42"/>
        <xsd:enumeration value="Copper Alloy"/>
        <xsd:enumeration value="Beryllium Copper"/>
        <xsd:enumeration value="Brass"/>
        <xsd:enumeration value="Phosphor Bronze"/>
        <xsd:enumeration value="Kovar"/>
        <xsd:enumeration value="Other"/>
        <xsd:enumeration value="NAC"/>
      </xsd:restriction>
    </xsd:simpleType>
```

```
</xsd:attribute>
<xsd:attribute name="bulkSolderTermination">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="Sn03"/>
      <xsd:enumeration value="Sn05"/>
      <xsd:enumeration value="Sn10"/>
      <xsd:enumeration value="Sn60"/>
      <xsd:enumeration value="Sn62"/>
      <xsd:enumeration value="Sn63"/>
      <xsd:enumeration value="SAC101"/>
      <xsd:enumeration value="SAC105"/>
      <xsd:enumeration value="SAC125"/>
      <xsd:enumeration value="SAC255"/>
      <xsd:enumeration value="SAC305"/>
      <xsd:enumeration value="SAC310"/>
      <xsd:enumeration value="SAC405"/>
      <xsd:enumeration value="NAC"/>
    </xsd:restriction>
  </xsd:simpleType>
</xsd:attribute>
<xsd:attribute name="plating">
  <xsd:simpleType>
    <xsd:restriction base="xsd:string">
      <xsd:enumeration value="Gold (Au)"/>
      <xsd:enumeration value="Gold (Au) - electroplated"/>
      <xsd:enumeration value="Gold (Au) - hard"/>
      <xsd:enumeration value="Indium (In)"/>
      <xsd:enumeration value="Nickel/Gold (Ni/Au)"/>
      <xsd:enumeration value="Nickel/Gold (Ni/Au) - electrolytic"/>
      <xsd:enumeration value="Nickel/Gold (Ni/Au) - ENIG"/>
      <xsd:enumeration value="Nickel/Palladium (Ni/Pd)"/>
      <xsd:enumeration value="Nickel/Palladium/Gold (Ni/Pd/Au)"/>
      <xsd:enumeration value="Nickel/Palladium/Gold (Ni/Pd/Au) - ENEPIG"/>
      <xsd:enumeration value="Organic Solderability Preservative (OSP)"/>
      <xsd:enumeration value="Organic Solderability Preservative (OSP-HT) - high temperature"/>
      <xsd:enumeration value="Palladium (Pd)"/>
      <xsd:enumeration value="Platinum/Palladium/Silver (Pt/Pd/Ag)"/>
      <xsd:enumeration value="Silver (Ag)"/>
      <xsd:enumeration value="Silver (Ag), electroplated"/>
      <xsd:enumeration value="Silver (Ag), immersion"/>
      <xsd:enumeration value="Silver (Ag), with Nickel (Ni) barrier"/>
      <xsd:enumeration value="Silver/Palladium (Ag/Pd)"/>
      <xsd:enumeration value="Silver/Palladium (Ag/Pd), Ni barrier"/>
      <xsd:enumeration value="Tin (Sn)"/>
      <xsd:enumeration value="Tin (Sn), bright"/>
      <xsd:enumeration value="Tin (Sn), bright, annealed"/>
      <xsd:enumeration value="Tin (Sn), bright, fused"/>
      <xsd:enumeration value="Tin (Sn), bright, reflowed"/>
      <xsd:enumeration value="Tin (Sn), bright, reflowed over Nickel (Ni) barrier"/>
      <xsd:enumeration value="Tin (Sn), bright, with Nickel (Ni) barrier"/>
      <xsd:enumeration value="Tin (Sn), bright, with Silver (Ag) barrier"/>
      <xsd:enumeration value="Tin (Sn), hot dipped"/>
      <xsd:enumeration value="Tin (Sn), immersion"/>
      <xsd:enumeration value="Tin (Sn), matte"/>
      <xsd:enumeration value="Tin (Sn), matte, annealed"/>
      <xsd:enumeration value="Tin (Sn), matte, fused"/>
      <xsd:enumeration value="Tin (Sn), matte, reflowed"/>
      <xsd:enumeration value="Tin (Sn), matte, reflowed over Nickel (Ni) barrier"/>
      <xsd:enumeration value="Tin (Sn), matte, with Nickel (Ni) barrier"/>
      <xsd:enumeration value="Tin (Sn), matte, with Silver (Ag) barrier"/>
      <xsd:enumeration value="Tin (Sn), reflowed"/>
```

```
          <xsd:enumeration value="Tin (Sn), Semi-matte"/>
          <xsd:enumeration value="Tin/Bismuth (SnBi)"/>
          <xsd:enumeration value="Tin/Bismuth (SnBi) - 5% Bi"/>
          <xsd:enumeration value="Tin/Bismuth/Gold (Sn/Bi/Au)"/>
          <xsd:enumeration value="Tin/Copper (Sn/Cu)"/>
          <xsd:enumeration value="Tin/Copper (Sn/Cu), annealed"/>
          <xsd:enumeration value="Tin/Copper (Sn/Cu), HASL"/>
          <xsd:enumeration value="Tin/Copper (Sn/Cu), hot dipped"/>
          <xsd:enumeration value="Tin/Copper (Sn/Cu), matte"/>
          <xsd:enumeration value="Tin/Lead (Sn10Pb90)"/>
          <xsd:enumeration value="Tin/Lead (Sn63Pb37)"/>
          <xsd:enumeration value="Tin/Lead/Silver (Sn/Pb/Ag)"/>
          <xsd:enumeration value="Tin/Silver (Sn/Ag)"/>
          <xsd:enumeration value="Tin/Silver (Sn/Ag), hot dipped"/>
          <xsd:enumeration value="Tin/Silver (Sn/Ag), plated"/>
          <xsd:enumeration value="Tin/Silver/Bismuth (Sn/Ag/Bi)"/>
          <xsd:enumeration value="Tin/Silver/Bismuth/Copper (Sn/Ag/Bi/Cu)"/>
          <xsd:enumeration value="Tin/Silver/Copper (Sn/Ag/Cu)"/>
          <xsd:enumeration value="Tin/Silver/Copper (Sn/Ag/Cu), hot dipped"/>
          <xsd:enumeration value="Tin/Zinc (Sn/Zn)"/>
          <xsd:enumeration value="Tin/Zinc/Aluminum (Sn/Zn/Al)"/>
          <xsd:enumeration value="Tin/Zinc/Nickel (Sn/Zn/Ni)"/>
          <xsd:enumeration value="NAC"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
  <xsd:complexType name="PSLRating">
    <xsd:attribute name="wave">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="W0"/>
          <xsd:enumeration value="W1"/>
          <xsd:enumeration value="W2"/>
          <xsd:enumeration value="W3"/>
          <xsd:enumeration value="W4"/>
          <xsd:enumeration value="W5"/>
          <xsd:enumeration value="W6"/>
          <xsd:enumeration value="W7"/>
          <xsd:enumeration value="W8"/>
          <xsd:enumeration value="W9"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
    <xsd:attribute name="waveAddInfo">
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="A"/>
          <xsd:enumeration value="C"/>
          <xsd:enumeration value="E"/>
          <xsd:enumeration value="F"/>
          <xsd:enumeration value="G"/>
          <xsd:enumeration value="H"/>
          <xsd:enumeration value="J"/>
          <xsd:enumeration value="K"/>
          <xsd:enumeration value="M"/>
          <xsd:enumeration value="N"/>
          <xsd:enumeration value="P"/>
          <xsd:enumeration value="R"/>
          <xsd:enumeration value="Y"/>
          <xsd:enumeration value="Z"/>
        </xsd:restriction>
```

```
        </xsd:simpleType>
      </xsd:attribute>
      <xsd:attribute name="reflow">
        <xsd:simpleType>
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="R0"/>
            <xsd:enumeration value="R1"/>
            <xsd:enumeration value="R2"/>
            <xsd:enumeration value="R3"/>
            <xsd:enumeration value="R4"/>
            <xsd:enumeration value="R5"/>
            <xsd:enumeration value="R6"/>
            <xsd:enumeration value="R7"/>
            <xsd:enumeration value="R8"/>
            <xsd:enumeration value="R9"/>
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:attribute>
      <xsd:attribute name="reflowAddInfo">
        <xsd:simpleType>
          <xsd:restriction base="xsd:string">
            <xsd:enumeration value="A"/>
            <xsd:enumeration value="C"/>
            <xsd:enumeration value="E"/>
            <xsd:enumeration value="F"/>
            <xsd:enumeration value="G"/>
            <xsd:enumeration value="H"/>
            <xsd:enumeration value="J"/>
            <xsd:enumeration value="K"/>
            <xsd:enumeration value="M"/>
            <xsd:enumeration value="N"/>
            <xsd:enumeration value="P"/>
            <xsd:enumeration value="R"/>
            <xsd:enumeration value="Y"/>
            <xsd:enumeration value="Z"/>
          </xsd:restriction>
        </xsd:simpleType>
      </xsd:attribute>
    </xsd:complexType>
    <xsd:complexType name="Phone">
      <xsd:attribute name="number" type="xsd:string"/>
      <xsd:attribute name="type" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="Email">
      <xsd:attribute name="address" type="xsd:string"/>
      <xsd:attribute name="type" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="SurfaceAddress">
      <xsd:attribute name="internal" type="xsd:string"/>
      <xsd:attribute name="street" type="xsd:string"/>
      <xsd:attribute name="city" type="xsd:string"/>
      <xsd:attribute name="stateProvince" type="xsd:string"/>
      <xsd:attribute name="country" type="xsd:string"/>
      <xsd:attribute name="postalCode" type="xsd:string"/>
      <xsd:attribute name="type" type="xsd:string"/>
    </xsd:complexType>
    <xsd:complexType name="MaterialGroupList">
      <xsd:sequence>
        <xsd:element name="MaterialGroupListID" type="UniqueID"/>
        <xsd:element name="MaterialGroup" type="MaterialGroup" maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
```

```
  <xsd:complexType name="MaterialGroup">
    <xsd:sequence>
      <xsd:element name="Amount" type="Amount" minOccurs="0"/>
    </xsd:sequence>
    <xsd:attribute name="name" type="xsd:string"/>
  </xsd:complexType>
  <xsd:complexType name="SubstanceCategoryList">
    <xsd:sequence>
      <xsd:element name="SubstanceCategoryListID" type="UniqueIDExtended"/>
      <xsd:element name="SubstanceCategory" type="SubstanceCategory" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="HomogeneousMaterialList">
    <xsd:sequence>
      <xsd:element name="HomogeneousMaterial" type="HomogeneousMaterial" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="RequestedInfoMatDec">
    <xsd:sequence>
      <xsd:element name="SubstanceList" type="SubstanceList"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="SubstanceList">
    <xsd:sequence>
      <xsd:element name="SubstanceCategory" type="SubstanceCategory" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="Include">
    <xsd:sequence>
      <xsd:element name="Sectional" type="Sectional" maxOccurs="unbounded"/>
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="Sectional">
    <xsd:sequence>
      <xsd:element name="SubSectional" type="SubSectional" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="name" >
    <xsd:simpleType>
      <xsd:restriction base="xsd:string">
        <xsd:enumeration value="MaterialInfo"/>
        <xsd:enumeration value="ManufacturingInfo"/>
      </xsd:restriction>
    </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
  <xsd:complexType name="SubSectional">
    <xsd:sequence>
      <xsd:element name="SubSectional" type="SubSectional" minOccurs="0" maxOccurs="unbounded"/>
    </xsd:sequence>
    <xsd:attribute name="name" >
      <xsd:simpleType>
        <xsd:restriction base="xsd:string">
          <xsd:enumeration value="A"/>
          <xsd:enumeration value="B"/>
          <xsd:enumeration value="C"/>
          <xsd:enumeration value="D"/>
        </xsd:restriction>
      </xsd:simpleType>
    </xsd:attribute>
  </xsd:complexType>
</xsd:schema>
```

The schema may be downloaded at http://www.ipc.org/175X.

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Standard Improvement Form

IPC-1751A

The purpose of this form is to provide the Technical Committee of IPC with input from the industry regarding usage of the subject standard.

Individuals or companies are invited to submit comments to IPC. All comments will be collected and dispersed to the appropriate committee(s).

If you can provide input, please complete this form and return to:

IPC
3000 Lakeside Drive, Suite 309S
Bannockburn, IL 60015-1249
Fax 847 615.7105
E-mail: answers@ipc.org

1. I recommend changes to the following:

___ Requirement, paragraph number __________

___ Test Method number __________, paragraph number __________

The referenced paragraph number has proven to be:

___ Unclear ___ Too Rigid ___ In Error

___ Other ______________________________

2. Recommendations for correction:

____

____

____

____

3. Other suggestions for document improvement:

____

____

____

____

Submitted by:

Name ______________________ Telephone ______________________

Company ______________________ E-mail ______________________

Address ______________________

City/State/Zip ______________________ Date ______________________

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